Calavera Hills and Robertson Ranch Habitat Conservation Area

(Dedicated natural areas set aside as part of the
Calavera Hills Phase II and Robertson Ranch developments)
(CNLM No. S031)

Annual Work Plan
October 2009 - September 2010

Prepared for:
U.S. Fish and Wildlife Service
California Department of Fish and Game
City of Carlsbad

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I. INTRODUCTION AND SUMMARY

This work plan has been developed from the guidelines for goals and objectives set forth in the Calavera Hills Phase II Final Habitat Management Plan (HMP)(Planning Systems 2002), and the Robertson Ranch East Village Open Space Land Management Plan (Planning Systems 2006). These Habitat Management Plans have been reviewed by and agreed upon by the City of Carlsbad, United States Fish and Wildlife Service (USFWS), and California Department of Fish and Game (CDFG).

The Center for Natural Lands Management (Center) holds conservation easements (since June 2006 for Calavera Hills Phase II, and February 2007 for Robertson Ranch East Village, and December 2007 for Robertson Ranch West Village Parcel 23C Phase I) on the Calavera Hills and Robertson Ranch Habitat Conservation Area (HCA) and performs or oversees the management tasks identified in the two Habitat Management Plans (collectively HMPs).

The Center has merged the funding and reporting for these two areas because of the common funding source, their proximity, and management similarities. This will also simplify future budgetary, reporting, and planning considerations.

The purpose of this work plan is to identify the tasks and budget required to complete the management activities for the upcoming management year that will begin on October 1, 2009 and end on September 30, 2010. Unless otherwise stated, all tasks will be performed by Center's Area Manager, Markus Spiegelberg and HCA Managers, Patrick McConnell and Jessica Vinje.

Summary of Tasks and Goals for the 2009-2010 Management Year:

- Maintain signs and existing fences
- Install signage, smooth-wire fencing, and vegetation to limit pedestrian and vehicular access
- Continue focused surveys for argentine ant (*Linepithema humile*) and harvester ant (*Pogonomyrex* and *Messor* spp.) colonies
- Conduct focused surveys for San Diego horned lizard (*Phrynosoma coronatum blainvillii*) and Belding's orangethroat whiptail (*Cnemidophorus hyperythrus beldingi*)
- Census and conduct habitat assessments of thread-leaved brodiaea (*Brodiaea filifolia*), and San Diego thornmint (*Acanthomintha ilicifolia*)
- Inventory plant species present at West Village PA 23C Phase I
- Continue to set up and conduct coastal sage scrub (CSS) long-term monitoring plots
- Survey for coastal California gnatcatcher (*Polioptila californica californica*)
- Set up and conduct East Village non-native grass control study
- Monitor and control nonnative, exotic plants
- Install plants and maintain the habitat restoration project at Village R
- Continue communications with the Calavera Hills and Robertson Ranch HOA's and homeowners regarding landscaping issues
- Conduct weekly patrol visits, continue blocking unwanted trails
- Remove trash as necessary

- Conduct conservation easement (CE) compliance of HCA
- Prepare and provide to the wildlife agencies and City of Carlsbad an annual report that describes the management activities and information gathered during the management year, and includes a CE compliance report for the management year
- Draft position paper for Carlsbad Habitat Management Plan (HMP) covered sensitive plant species, Orcutt's hazardia (*Hazardia orcuttii*) and Del Mar Manzanita (*Arctostaphylos glandulosa* var. *glandulosa*)
- Provide an accounting of funds to be spent in the management year

Appendix 1 (*Task Schedule*) identifies the approximate schedule of tasks for the upcoming management year. Appendix 2 (*Annual Budget*) provides a financial summary for both staff time and costs for the year. The location of the HCA is shown in Appendix 3. The HCA is comprised of seven parcels, commonly referred to as Village H, R, U, W, and X, Robertson Ranch East Village, and Robertson Ranch West Village PA 23C Phase I, the first phase of a two phase parcel recordation process (Appendix 3).

II. MANAGEMENT ACTIVITIES

The following sections identify and describe the activities to be performed during the upcoming management year. Based upon the Property Analysis Record (PAR) developed by the Center to outline long-term management tasks and costs, management activities for the HCA can be categorized into seven groups: Capital Improvements, Biological Surveys, Habitat Restoration, Public Services, Reporting, Office Maintenance, and Operations. Each of these categories will be discussed below.

A. CAPITAL IMPROVEMENTS

The installation of signs and fences will occur during this management year:

1. Signing Signs will be maintained at all of the major access points and along most of the perimeter to the HCA and a few other notable locations. Signage will be installed along the newly installed post and cable fencing along either side of College Ave. Signage will also be placed along the northern section of the eastern parcel of Village K, and along all fencing along the Village H trail. Each sign explains that the HCA is a dedicated as a habitat preserve, and that fire, off-road vehicle use, dumping, and shooting are prohibited.

2. Fencing The Center will work with City of Carlsbad Parks and Recreation personnel in finishing their planned split rail fencing at Village H. Smooth wire fencing may be installed in order to dissuade people from entering the sensitive shrub and grassland sites farther north along gaps in split rail fencing. There remain several unwanted, redundant trails crossing Village U, and we will install and maintain signage and anchored vegetation at points to dissuade entry. We may install short sections of fencing in combination with anchored vegetation.

B. BIOLOGICAL SURVEYS

Biological monitoring activities at the HCA will follow items listed in the HMPs. The Center has modified monitoring tasks outlined in the HMPs to adjust the task time lines and some of the tasks which it finds to be unnecessary at this time. Below is a description of the tasks that will be accomplished during the upcoming management year. In addition, Table 1 outlines all tasks that will be completed at the HCA and an associated time line for the next five years.

Monitoring during the next year includes continued surveys for native and non-native ant species, coastal California gnatcatcher surveys, and habitat assessments for the two federally listed plant species that occur on the HCA; and the second year of a long-term CSS monitoring program. All data will be entered or stored in a Geographic Information System (GIS) database, or in MS Excel. Brief descriptions of monitoring activities outlined by taxa are provided below:

1. Animal Sampling

a. Focused ant surveys We will continue to conduct systematic surveys for native and non-native ants present in areas of HCA deemed suitable or previously noted to contain San Diego coast horned lizard. Surveys will be conducted by sinking an attractant in covered containers below the soil surface (animal friendly Sierra ® antifreeze solution in baby food jars). Locations of ant colonies by species may be entered into a geographic positioning device. Locations of Argentine ant foraging may then be more effectively controlled (See section C.5).

b. Herpetological surveys We will map any direct and indirect evidence of occupation by coast horned lizards or Belding's orange-throat whiptail throughout the HCA during the late spring and summer of 2010.

c. Coastal California gnatcatcher surveys We will conduct two or three focused surveys for coastal California gnatcatchers during the spring months and note other sensitive bird species. Surveys will take place in all parcels.

2. Vegetation Sampling

a. Native grassland assessments The native grassland areas of the Village H parcel are of high quality, and support thread-leaved brodiaea populations. These grasslands are on a bi-annual sampling cycle, and were sampled during the 2008-2009 fiscal year. Therefore, we will again perform transect sampling during the 2010-2011 fiscal year, but not this fiscal year. For detail of cover by species, by origin, habit, and species richness over the past two sampling cycles see CNLM 2009.

b. Coastal sage scrub long-term monitoring Several more long-term vegetation monitoring plots will be installed throughout the HCA as part of our objective to track changes in species cover, presence, and population attributes over time. More

information about the justification for these plots, and the sampling design is provided in Appendix 4.

Table 1 Schedule of Biological Monitoring Tasks

Monitoring task	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
Focused sensitive reptile surveys[1]	X			TBD	TBD
Native and non-native ant surveys	X	TBD	TBD	TBD	TBD
Coastal California gnatcatcher surveys (including observations of other sensitive avian species)	X	TBD	TBD	X	TBD
Native grassland vegetation community assessments		X		X	
Coastal sage scrub quantitative monitoring[2]	X	X	X	TBD	
San Diego thornmint surveys[3]	X	X	TBD	TBD	TBD
Thread-leaved brodiaea surveys[4]	X	X	TBD	TBD	TBD
San Diego thornmint and thread-leaved brodiaea habitat assessments	X	X	TBD	TBD	TBD

1. Focused reptile surveys will occur in lieu of installing and monitoring pitfall arrays. Pitfall arrays will not be installed because the HCA is heavily used by the public. Based on Center experience, these arrays would likely be vandalized.
2. The Center initiated coastal sage scrub quantitative monitoring during the 2008-2009 management year.
3. Two San Diego thornmint found May 2008 near northwestern boundary of Village X parcel. Four found Spring 2009.
4. Additional thread-leaved brodiaea found in Village X parcel spring 2008, vegetation counted spring 2009.

3. Sensitive Plant Species Surveys will continue to be conducted for thread-leaved brodiaea and San Diego thornmint in Village X parcel. Habitat assessments will take place among populations here, and in Village H. Habitat assessments will be performed by using point-intercept from sub-plot sampling in stratified-random locations inside populations. Cover by species, species diversity, and edaphic information will be collected using the point-intercept estimates. The thornmint population does not occur inside the HCA, but rather occurs very close to the HCA. Because of the close proximity of this population to the HCA (within ten

feet), it is desirable to continue its monitoring in the hope that nearby conditions will be suitable for population expansion.

Palmer's grappling hook (*Harpagonella palmeri*) and small flowered microseris (*Microseris douglasii* var. *platycarpha*) will be censused where found. In cases where a population is too large to count, subplot sampling will also be used to generate population estimates and density.

If time and conditions permit, western dichondra (*Dichondra occidentalis*), small-flowered morning glory (*Convolvulus simulans*), and California adolphia (*Adolphia californica*) will be mapped where found throughout the HCA. Other sensitive plants will be censused and mapped, if located. See CNLM 2009 for results of activities carried out during 2008-2009 management year. Table 2 lists probable threats to sensitive plants known to occur in the HCA.

4. **West Village botanical inventory** HCA manager will again survey existing habitat in parcel PA 23C for sensitive species, and perform a general species inventory. Visits will take place during late winter/spring, late spring/summer to capture total species richness.

C. HABITAT RESTORATION AND MAINTENANCE

Most of the HCA's habitat is good quality, with little disturbance from nonnative plant species. There are nonnative invasive plants scattered throughout the HCA, however. The Center has budgeted for continuing the eradication efforts in Village H, X, and Robertson Ranch parcels.

1. **Village H weeds** Fennel (*Foeniculum vulgare*), crown daisy (*Chrysanthemum coronarium*), artichoke thistle (*Cynara cardunculus*), and Bermuda-buttercup (*Oxalis pes-caprae*) patches will continue to be controlled in this area of the HCA. Since 2006, the southern end of Village H has been periodically mowed and skid-sprayed in order to reduce the seed production of persistent weeds. More mowings will occur during 2009 in order to continue the eradication effort. Fennel has been largely reduced throughout Village H since the contracted treatments of 2006, with the exception of the east-facing hillside in the southern quarter of Village H. The western margins of Village H did not receive weed control during the 2008-2009 fiscal year due to budget cuts. We will focus weed control efforts there also.

Table 2. Sensitive plants present and threats 2009-2010

Name	Threats	Actions Planned
Thread-leaved brodiaea MHCP[1], FT[2]	Human disturbance Non-native grasses and forbs	Frequent patrol Yearly habitat assessments[3]
San Diego thornmint MHCP, FT	Human disturbance Non-native grasses and forbs	Frequent patrol Yearly habitat assessments
Small-flowered microseris[4] CNPS List 4.2	Human disturbance Non-native grasses and forbs	Frequent patrol
Western dichondra[4] CNPS List 4.2	Human disturbance	Frequent patrol
Palmer's grapplinghook[4] CNPS List 4.2	Human disturbance Non-native grasses and forbs	Frequent patrol
Small flowered morning glory[4] CNPS List 4.2	Human disturbance Non-native grasses and forbs	Frequent patrol Yearly habitat assessments coincident with thornmint & brodiaea surveys
California adolphia[4] CNPS List 2.1	Human disturbance Non-native grasses and forbs	Frequent patrol CSS monitoring

1 MHCP refers to Multi Habitat Conservation Program for Northern San Diego County, these species are listed under the Carlsbad HMP (Habitat Management Plan), thereby requiring certain management measures to attain.
2 FT = Federally listed as threatened.
3 Habitat assessments determine whether weed removal activities are needed. For non-focus species, long-term css monitoring will determine trends in non-native cover that can then be actionable. Other direct threats to native cover such as trails or vandalism can be observed and noted during regular patrol activities.
4. In many cases, Palmer's grapplinghook and small flowered morning glory co-occur with San Diego thornmint and/or thread-leaved brodiaea. In these cases, detailed cover data will reveal changes in cover values that may be detrimental. Since neither of these species, or other non-MHCP listed species are a priority for study, long-term css monitoring (Appendix 4), and coincidental information derived from thornmint and brodiaea studies will be relied upon for trend information.

2. **Robertson Ranch and Village X weeds** Tight budget conditions have lead to the budgeting of only two five-person contractor days this fiscal year. In both cases, the contractors will be focused in and around Village X. The Robertson Ranch West Village Planning Area 23-C (PA 23C) parcel has numerous saltcedar (*Tamarix* spp.) along a small drainage, and this will be the focus of one contractor day. Another contractor day will be continuing the removal of black mustard and other weeds along the western areas of Village X parcel. This area holds much promise, as soil conditions appear to be favorable to expansion of nearby thread-leaved brodiaea populations.

3. **Village R restoration** Village R is re-vegetating surprisingly well, through planting as well as through natural recruitment of native shrubs. Appendix 5 contains a close-

up of the restoration area. This year, the site outlined is to receive approximately 100 more cactus pads and as many as 600 more container plants by mid-winter 2009-2010. We have budgeted for the planting, weeding activities, and hand watering through 2010. The plant pallet consists of eight species, in differing portions of the total contribution. The out-plantings will consist of blue-eyed grass (*Sisyrinchium bellum*), decumbent goldenbush (*Isocoma menziesii var. decumbens*), California aster (*Corethrogyne filaginifolia* var. *filaginifolia*), rush rose (*Heliantemum scoparium*), coast monkeyflower (*Mimulus aurentiacus* var. *puniceus*), California encelia (*Encelia californica*), spineshrub (*Adolphia californica*), and California everlasting (*Gnaphalium californicum*). Attempts will be made to start native grasses (*Nassella* spp.), and other native forbs from hand-dispersing or imprinting seed.

4. **West Village and East Village re-vegetation** Brookfield homes and Robertson Family Trust are responsible for eventually re-vegetating approximately 3.2 and 20.5 acres of West Village parcel, respectively, as mitigation measures for development. The Center will continue to work with developers and assigned contractors to ensure that compliance with re-vegetation plans is carried out. Brookfield has also assumed responsibility for the wetland restoration project in East Village parcel either side of Calavera Creek (Calavera Hills Phase II restoration obligation), and for the remaining 10.2 acres of upland re-vegetation in East Village parcels. Recon Environmental continues to be the biological monitor here, and D&D Wildlife Habitat Restoration, Inc. has been performing the installation and maintenance. The Center will stay involved with ensuring compliance with re-vegetation goals and that pertinent documents are made available (to whom?) wherever possible.

5. **East Village non-native grass control study** We plan to implement a disturbed grassland study involving Fusilade ®, a grass specific herbicide in some yet to be determined locations in Robertson Ranch parcel west of College Ave. This study may also incorporate a thatch removal component. This parcel contains mixtures of native shrubs and grasses in a dense matrix of non-native grass. As a response to treatment(s) and controls, we will study pre and post cover by species, origin, and habit, as well as general species richness. This project will be overseen and implemented by CNLM.

D. PUBLIC SERVICES

Public services activities include the patrolling of the HCA; consulting with neighbors, HOA representatives, and landscapers about perimeter landscaping; and responding to emergencies. However, other opportunities for public service will undoubtedly be forthcoming during the year with local groups and individuals interested in volunteering labor for HCA projects, and class field trips from local schools. Whenever possible, management will try to accommodate these activities.

1. **Outreach** The landscaping bordering the HCA is typically high-water use. The result of this hydrophilic vegetation is excess water seepage into HCA edges, which will lead to

conversion of dry-adapted vegetation to wetland vegetation, and which favors the establishment of weeds. The Center will continue to work with HOA representatives regarding this matter. We recently drafted a CE Notice of Violation concerning several long-ignored issues, with the intention of sending this to Curtis Management, who manage the properties adjacent to parcels that are being affected.

3. **Patrols** Patrols will be performed approximately four times per month, and also during biological surveys or other HCA activities. Patrols include the routine maintenance of fences, signs and trash removal. Observations of sensitive species, new human impacts, new weed infestations, and trash will be gathered during patrols as well.

4. **Emergency Response** Staff time has been allocated from the current budget for response to emergencies on the HCA. Such emergencies could include response to wildfires, wildlife problems reported by neighbors, and trespass issues.

E. REPORTING

Reporting requirements include the management of the HCA's database/GIS system, the photo-documentation stations, and the production of various status reports to the City of Carlsbad, USFWS, CDFG, and Center administration.

1. **Database/GIS Management** Data derived from routine patrols and photo-documentation will be entered into and maintained in the HCA's existing database/GIS system. Additional databases will be established for the various biotic monitoring programs including the production of historical and current vegetation maps. Efforts will be made to coordinate and standardize database fields and parameters with other HCAs.

2. **Photo-documentation Stations** Permanent photo documentation stations were established for the Calavera properties in 2006 and photographs were labeled and stored. Photographs at these stations will be updated in 2010, as necessary. Baseline photo points were established for Robertson Ranch West Village PA 23 C Phase I parcel along with Robertson Ranch East parcels during the summer 2008.

3. **Reports**

a. **Year-End/Agency Reports** A year-end report will be prepared by the HCA manager by December of 2010 detailing the results of the year's management activities. This report will include recommendations for the continuation of various activities for the following management year and will be submitted to the City of Carlsbad, USFWS, and CDFG, as required under permit reporting conditions.

b. **Annual Work Plan** The annual work plan for the 2010-2011 management year will be formulated by the end of the 2009-2010 management year and will be based upon experiences during previous years' operations. This work plan will be submitted to the City of Carlsbad and USFWS and CDFG.

c. **Conservation Easement (CE) Compliance** The HCA Manager will monitor compliance of all areas of the Conservation Easement to ensure the conservation values are maintained in perpetuity. Compliance visits are to be carried out during the later portion of the management year, and will be appended to each year's annual report. The next management year will encompass the fourth CE Compliance visit cycle for Calavera Hills parcels, and the second CE Compliance visit for Robertson Ranch parcels. All parcels are included in the same annual CE compliance since the 2008-2009 fiscal year.

d. **Position Paper Preparation** The Center is conducting rare plant and animal monitoring and research on our HCA system. Data are being collected and compiled on these plants and animals. The Center has allocated funds to begin preparation of position papers for certain City of Carlsbad's Covered Species (plants). These papers will summarize what is known and not known about each species and will provide recommendations on what research and/or management actions are needed for conservation and perpetual management of each species.

F. OFFICE MAINTENANCE

HCA management will maintain offices in an organized manner to facilitate maximum efficiency. This section of the budget includes outlays for general office work, utilities, and telephones, among other items/tasks.

G. OPERATIONS

Operations include the training and professional growth of Center personnel, and inspection of the HCA by Center administration. Funds have been allocated in the current budget for the HCA Managers to attend classes or seminars during the upcoming year. Also included within this category of activity is the conduct of employee reviews.

III. WORKLOAD AND BUDGETS

1. **Supervision and Staffing:** The Area Manger will be supervised by the Center=s Director of Conservation Science, Dr. Deborah Rogers. Tasks and hours will be coordinated by the Area Manager and approved by Dr. Rogers. The Area Manager, Markus Spiegelberg, will supervise the HCA Managers Patrick McConnell, and Jessica Vinje.

2. **Budgeting**: A budget of $58,416 has been allocated for this management year and is included here as Appendix 2. Every effort will be made by HCA Management to allocate time and expenses according to this estimated budget.

IV. REFERENCES

CNLM. 2009. Calavera Hills and Robertson Ranch Habitat Conservation Area Annual Report October 2008- September 2009.

Merkel & Associates. 2004. Biological Resources Report for the Robertson Ranch Project Carlsbad California. August 2004.

Planning Systems. 2002**.** Calavera Hills Phase II Final Habitat Management Plan. October 2002.

Planning Systems. 2006. Robertson Ranch East Village Open Space Land Management Plan. November 2006.

V. APPENDICES

Appendix 1

2009-2010 Task Schedule

Task	October-December 2009	January-March 2010	April to June 2010	July to September 2010
West Village plant surveys		X	X	X
Sensitive Plant Habitat assessments			X	
Coastal Sage Scrub Monitoring			X	
Ant Sampling and Identification			X	X
Herpetological surveys			X	X
Coastal California Gnatcatcher surveys		X	X	
GIS/Database			X	
East Village exotic grass control study	X	X	X	
Village R Restoration	X	X	X	X
Nonnative Plant Removal	X	X	X	X
Fencing/Signage/Trail Blocking	X	X	X	X
Patrolling	X	X	X	X
Reports & CE Compliance				X
Position Papers	X			X
HOA Outreach	X	X	X	

Appendix 2

Annual Budget 2009-2010

Budget Task Detail

Calavera Hills 09-10

Annual Budget for Yr 2009-2010

Ongoing Expenses

10/06/2009

Task list	Specific Description	Unit	Reinvestment	Quantity	Rate	Num Yrs	Cost	Contingency	Administration	Total Cost
Biotic Surveys										
Conservation Easement	Compliance	L. Hours		12.00	30.55	1	366.60	0.00	87.98	454.58
Entomologist	Field Survey ants	L. Hours		24.00	30.55	1	733.20	0.00	175.96	909.16
Herpetologist	Field Survey PM	L. Hours		16.00	30.55	1	488.80	0.00	117.31	606.11
Ornithologist	Field Survey PM	L. Hours		32.00	30.55	1	977.60	0.00	234.62	1,212.22
Plant Ecologist	Field Survey CSS	L. Hours		16.00	36.20	1	579.20	0.00	139.00	718.20
Plant Ecologist	Field Survey CSS	L. Hours		24.00	30.55	1	733.20	0.00	175.96	909.16
Plant Ecologist	Hab assessment,	L. Hours		24.00	30.55	1	733.20	0.00	175.96	909.16
Plant Ecologist	Hab assessment:	L. Hours		8.00	36.20	1	289.60	0.00	69.50	359.10
Plant Ecologist	Hab assessment:	L. Hours		8.00	30.55	1	244.40	0.00	58.65	303.05
Plant Ecologist	Hab assessment:	L. Hours		8.00	36.20	1	289.60	0.00	69.50	359.10
Plant Ecologist	Research PM	L. Hours		8.00	30.55	1	244.40	0.00	58.65	303.05
Plant Ecologist	TLB Study JV	L. Hours		20.00	36.20	1	724.00	0.00	173.76	897.76
Plant Ecologist	TLB Study PM	L. Hours		20.00	30.55	1	611.00	0.00	146.64	757.64
Plant Ecologist	West Village bio	L. Hours		8.00	30.55	1	244.40	0.00	58.65	303.05
Science Director	Coordination/Overs	L. Hours		15.00	50.00	1	750.00	0.00	180.00	930.00
Sub total							8,009.20	0.00	1,922.20	9,931.40
Field Equipment										
General	As needed	Year		1.00	119.00	1	119.00	0.00	28.56	147.56
General	Boots	Pair		1.00	195.00	1	195.00	0.00	46.80	241.80
General	Uniform allowance:	Unit		1.00	44.00	1	44.00	0.00	10.56	54.56
Vehicle	Mileage AM	Miles		250.00	0.55	1	137.50	0.00	33.00	170.50
Vehicle	Mileage PM	Miles		5,200.00	0.55	1	2,860.00	0.00	686.40	3,546.40
Vehicle	Mileage PM (JV)	Miles		110.00	0.55	1	60.50	0.00	14.52	75.02
Vehicle	Mileage Ranger	Miles		1,200.00	0.55	1	660.00	0.00	158.40	818.40
Sub total							4,076.00	0.00	978.24	5,054.24

NOTE: Because the values are rounded, there may be small errors.

Budget Task Detail

Calavera Hills 09-10

Annual Budget for Yr 2009-2010

Ongoing Expenses

10/06/2009

Task list	Specific Description	Unit	Reinvestment	Quantity	Rate	Num Yrs	Cost	Contingency	Administration	Total Cost
Habitat Maintenance										
Exotic Plant Control	Contractors Village	C. Hours		42.00	35.60	1	1,495.20	0.00	358.84	1,854.04
Exotic Plant Control	Contractors West	C. Hours		42.00	35.60	1	1,495.20	0.00	358.84	1,854.04
Exotic Plant Control	East Village NNG	L. Hours		24.00	30.55	1	733.20	0.00	175.96	909.16
Exotic Plant Control	East Village plot	L. Hours		32.00	1.50	1	48.00	0.00	11.52	59.52
Exotic Plant Control	Supervise	L. Hours		16.00	30.55	1	488.80	0.00	117.31	606.11
Exotic Plant Control	Skid spray	Fee		1.00	200.00	1	200.00	0.00	48.00	248.00
Exotic Plant Control	Mechanical and	C. Hours		100.00	30.55	1	3,055.00	0.00	733.20	3,788.20
Exotic Plant Control	Herbicide	Gallon		0.50	150.00	1	75.00	0.00	18.00	93.00
Exotic Plant Control	Herbicide Fusilade	Unit		1.00	85.50	1	85.50	0.00	20.52	106.02
Exotic Plant Control	Herbicide	Gallon		0.50	147.00	1	73.50	0.00	17.64	91.14
Mower, Tractor	Stan Cole	L. Hours		4.00	100.00	1	400.00	0.00	96.00	496.00
Sub total							8,149.40	0.00	1,955.85	10,105.25
Habitat Restoration										
Exotic Plant Control	Hand Removal Vill	L. Hours		32.00	30.55	1	977.60	0.00	234.62	1,212.22
Exotic Plant Control	Backpack Spray,	Gallon		6.00	65.00	1	390.00	0.00	93.60	483.60
Exotic Plant Control	Backpack Spray	L. Hours		24.00	30.55	1	733.20	0.00	175.96	909.16
Irrigation System	Water fee per unit	Unit		4.00	2.29	1	9.16	0.00	2.19	11.35
Irrigation System	Water meter	Month		6.00	20.36	1	122.16	0.00	29.31	151.47
Plant Procurement	Pots, flats, soil mix	Misc.		1.00	50.00	1	50.00	0.00	12.00	62.00
Revegetation	Plant Installation,	L. Hours		24.00	30.55	1	733.20	0.00	175.96	909.16
Revegetation	Student learning	L. Hours		32.00	30.55	1	977.60	0.00	234.62	1,212.22
Revegetation	Watering installed	L. Hours		56.00	30.55	1	1,710.80	0.00	410.59	2,121.39
Seeding	Hand seeding trials	Lb		16.00	30.55	1	488.80	0.00	117.31	606.11
Seeding	Plot marking	Item		16.00	1.50	1	24.00	0.00	5.76	29.76
Sub total							6,216.52	0.00	1,491.96	7,708.48

NOTE: Because the values are rounded, there may be small errors.

Budget Task Detail

Calavera Hills 09-10

Annual Budget for Yr 2009-2010

Ongoing Expenses

10/06/2009

Task list	Specific Description	Unit	Reinvestment	Quantity	Rate	Num Yrs	Cost	Contingency	Administration	Total Cost
Office Maintenance										
Office Supplies,	Computer and	Year		1.00	255.00	1	255.00	0.00	61.20	316.20
Office Supplies,	Computer and	Year		1.00	50.00	1	50.00	0.00	12.00	62.00
Rent	Office	Year		1.00	632.40	1	632.40	0.00	151.77	784.17
Rent	Office	Year		1.00	186.00	1	186.00	0.00	44.64	230.64
Telephone Charges,	Phone Charges,	Year		1.00	408.00	1	408.00	0.00	97.92	505.92
Telephone Charges,	Phone Charges,	Year		1.00	100.00	1	100.00	0.00	24.00	124.00
Sub total							1,631.40	0.00	391.53	2,022.93
Operations										
Audit	Audit-cost share	Fee		1.00	604.95	1	604.95	0.00	145.18	750.13
Conferences	Retreat and	L. Hours		7.00	36.20	1	253.40	0.00	60.81	314.21
Conferences	Retreat and	L. Hours		9.00	45.53	1	409.77	0.00	98.34	508.11
Conferences	Retreat and	Year		1.00	264.49	1	264.49	0.00	63.47	327.96
Conferences	Retreat and	L. Hours		7.00	30.55	1	213.85	0.00	51.32	265.17
Insurance	General	Fee		1.00	387.08	1	387.08	0.00	92.89	479.97
Other	Vacation, Holiday	L. Hours		30.00	45.53	1	1,365.90	0.00	327.81	1,693.71
Other	Vacation, Holiday	L. Hours		80.00	30.55	1	2,444.00	0.00	586.56	3,030.56
Other	Vacation, Holiday	L. Hours		15.00	24.08	1	361.20	0.00	86.68	447.88
Sub total							6,304.64	0.00	1,513.11	7,817.75

NOTE: Because the values are rounded, there may be small errors.

Budget Task Detail

Calavera Hills 09-10

Annual Budget for Yr 2009-2010

Ongoing Expenses

10/06/2009

Task list	Specific Description	Unit	Reinvestment	Quantity	Rate	Num Yrs	Cost	Contingency	Administration	Total Cost
Public Services										
Access Control	6' galvanized	Unit		10.00	27.00	1	270.00	0.00	64.80	334.80
Kiosk, Redwood		Unit		1.00	100.00	1	100.00	0.00	24.00	124.00
Patrolling	Patrol AM (MS)	L. Hours		8.00	45.53	1	364.24	0.00	87.41	451.65
Patrolling	Patrol PM	L. Hours		40.00	30.55	1	1,222.00	0.00	293.28	1,515.28
Patrolling	Patrol Ranger	L. Hours		100.00	24.08	1	2,408.00	0.00	577.92	2,985.92
Sign	Access	Item		9.00	0.77	1	6.93	0.00	1.66	8.59
Sign	wood backing	Item		1.00	10.00	1	10.00	0.00	2.40	12.40
Volunteer Coordinator	Meetings, HOA	L. Hours		8.00	30.55	1	244.40	0.00	58.65	303.05
Sub total							4,625.57	0.00	1,110.13	5,735.70
Reporting										
Administrative	Operations AM	L. Hours		32.00	45.53	1	1,456.96	0.00	349.67	1,806.63
Administrative	Operations PM	L. Hours		10.00	36.20	1	362.00	0.00	86.88	448.88
Administrative	Operations PM	L. Hours		60.00	30.55	1	1,833.00	0.00	439.92	2,272.92
Agency Report	Position paper PM	L. Hours		16.00	30.55	1	488.80	0.00	117.31	606.11
Annual Reports	Annual Report PM	L. Hours		24.00	30.55	1	733.20	0.00	175.96	909.16
Annual Reports	Summary AM	L. Hours		4.00	45.53	1	182.12	0.00	43.70	225.82
Annual Work Plan	Plan And Par	L. Hours		2.00	45.53	1	91.06	0.00	21.85	112.91
Annual Work Plan	Plan And Par	L. Hours		8.00	30.55	1	244.40	0.00	58.65	303.05
GIS/CAD Management	Data Management	L. Hours		4.00	45.53	1	182.12	0.00	43.70	225.82
GIS/CAD Management	Data Management	L. Hours		4.00	65.00	1	260.00	0.00	62.40	322.40
GIS/CAD Management	Data Management,	L. Hours		24.00	30.55	1	733.20	0.00	175.96	909.16
Sub total							6,566.86	0.00	1,576.04	8,142.90

NOTE: Because the values are rounded, there may be small errors.

Budget Task Detail

Calavera Hills 09-10

Annual Budget for Yr 2009-2010

Ongoing Expenses

10/06/2009

Task list	Specific Description	Unit	Reinvestment	Quantity	Rate	Num Yrs	Cost	Contingency	Administration	Total Cost
Site Construction/Maint.										
Fence	T-posts 5 foot L	Item		20.00	4.66	1	93.20	0.00	22.36	115.56
Fence	Bailing wire	Item		1.00	4.47	1	4.47	0.00	1.07	5.54
Fence	Smooth wire,	Roll		1.00	130.00	1	130.00	0.00	31.20	161.20
Fence	Labor PM	L. Hours		16.00	30.55	1	488.80	0.00	117.31	606.11
Fence	Labor Ranger	L. Hours		24.00	24.08	1	577.92	0.00	138.70	716.62
Lock	Padlock	Item		2.00	22.00	1	44.00	0.00	10.56	54.56
Rubbish handling	Dumpster, 20 CY,	Month		1.00	191.72	1	191.72	0.00	46.01	237.73
Sub total							1,530.11	0.00	367.22	1,897.33
Sub Total for All Categories							47,109.70	0.00	11,306.32	58,416.02

NOTE: Because the values are rounded, there may be small errors.

Appendix 3

HCA Location Maps

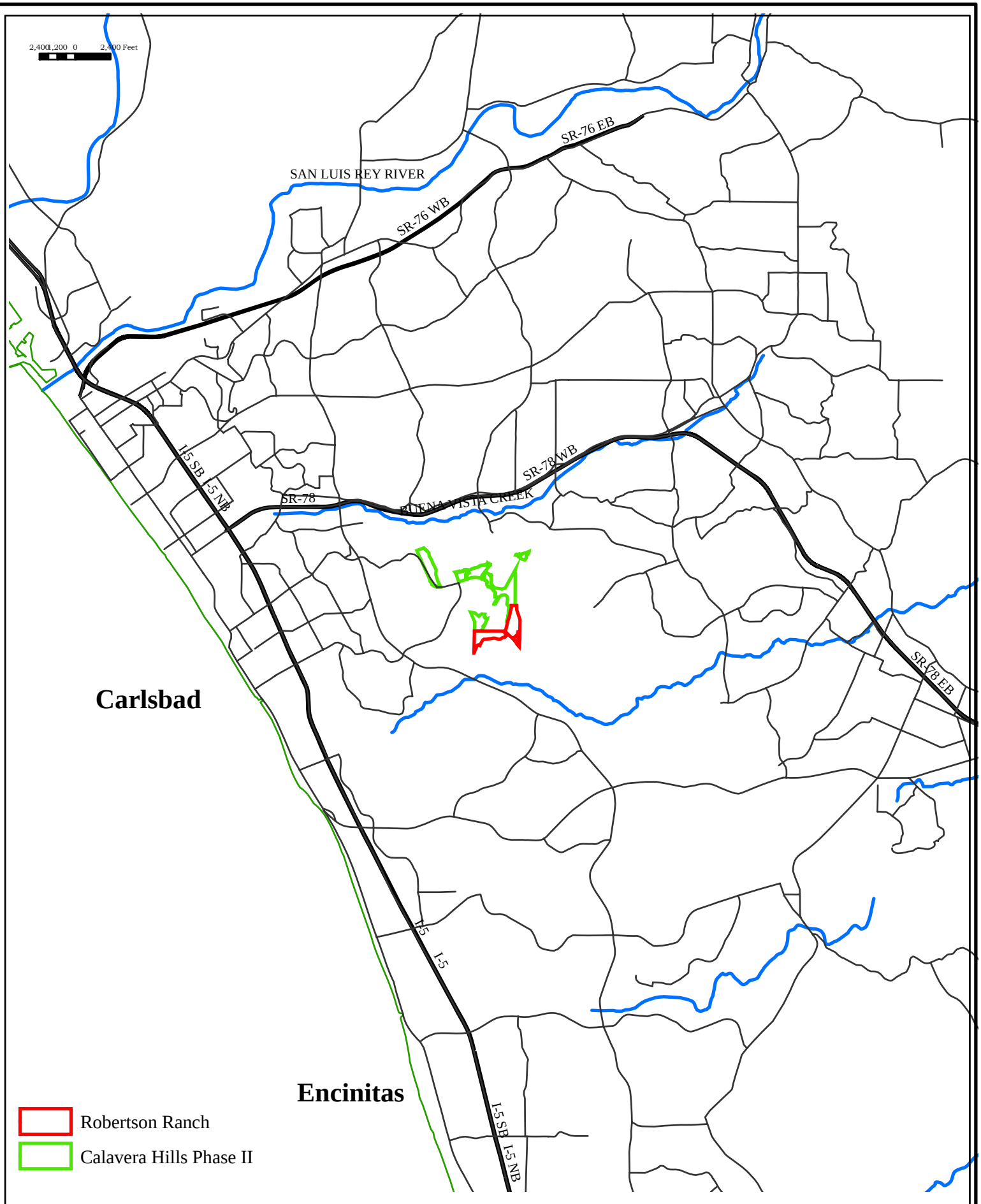

Figure 1
Preserve Vicinity
Roberstson Ranch and Calavera Hills Phase II Habitat Conservation Area - Carlsbad, CA

Center for Natural Lands Management

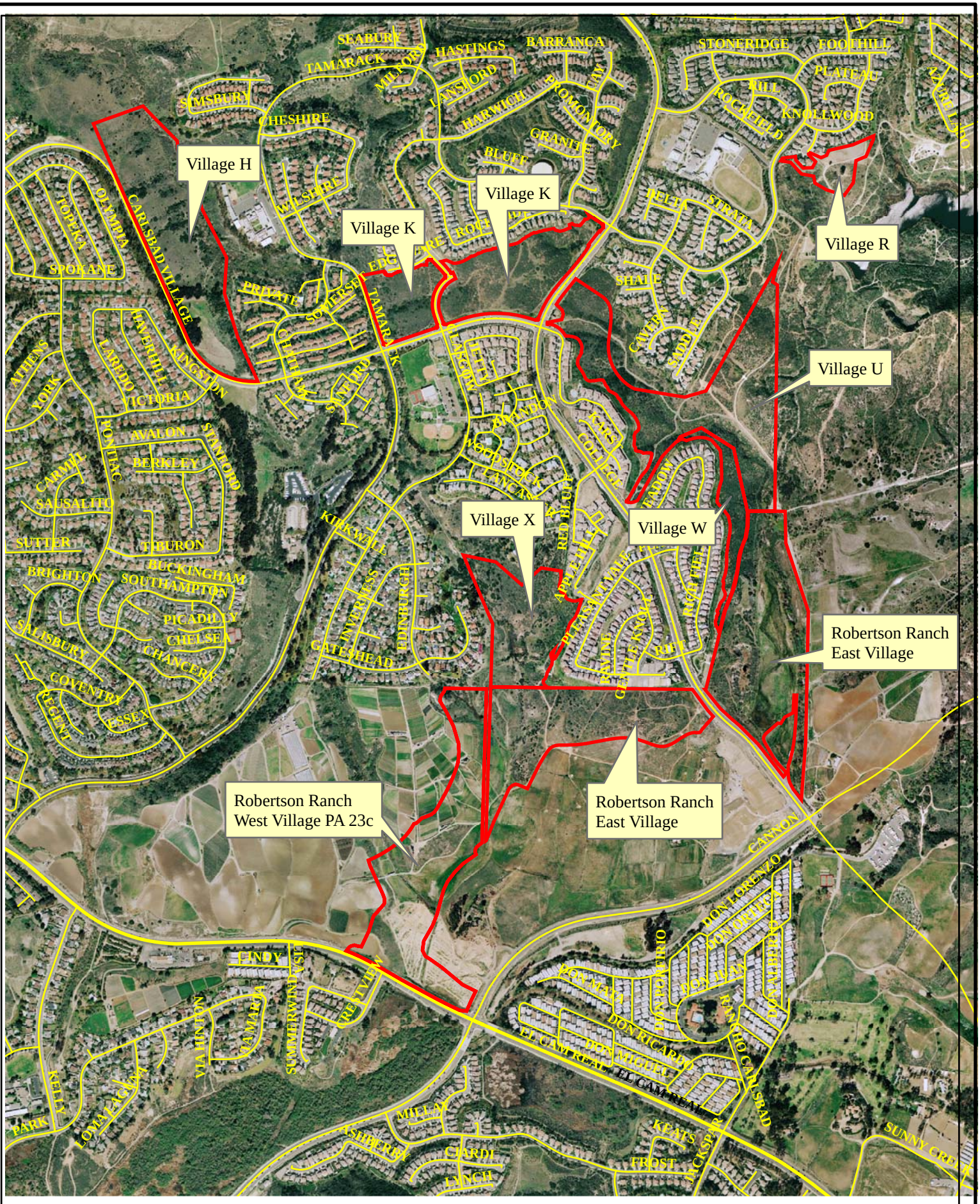

Figure 2. Preserve Location Map

Calavera and Robertson Ranch Habitat Conservation Area

380 190 0 380 Feet

Center for Natural Lands Management

Appendix 4

Coastal Sage Scrub Long-Term Monitoring Plan

The Center for Natural Lands Management-San Diego: Coastal Sage Scrub Monitoring Plan

Objective: Track the changes in structure and composition of the coastal sage scrub (CSS) community.

a. Use data to evaluate the structure and composition of the CSS vegetation community and its correlation to predictions of vegetation changes based on theories postulated by ecological and threats models.
b. Use data to evaluate changes or trends in "populations", presence/absence and/or occupied/unoccupied habitat of sensitive animal species, primarily the coastal California gnatcatcher (*Polioptila californica californica*)(CAGN).
c. Use data to evaluate changes in plant diversity.
d. Use data to evaluate changes over time from a baseline vegetation pattern.
e. Use data to guide vegetation management decisions (i.e. nonnative plant removal, rare species. range increases/introductions).

Background of Need:

The Center for Natural Lands Management (CNLM) manages several thousand acres of CSS in San Diego County. These areas host several threatened, endangered and sensitive plant and wildlife species, provide key locations for wildlife movement and are some of the last remaining stands of CSS in coastal San Diego. These areas were also specifically designated as important areas to conserve as part of regional Habitat Conservation Planning (HCP) conservation efforts.

As a result, the CNLM needs to be able to evaluate recruitment and vigor of this vegetation community over time to guide management decisions and to evaluate changes in plant and animal communities. This monitoring will also provide an opportunity to evaluate theorized predictions of changes in vegetation communities resulting from urbanization, nonnative species invasion, global warming, increased edge, altered fire regime and fragmentation (to name a few).

Background of Ecological Model and Threats

CSS is a fire-adapted vegetation community with fires occurring naturally, but most severely under the extreme Santa Ana heat and winds of late summer and fall and during drought conditions. During these conditions there would generally be a "complete burn" where all above ground vegetation within the fire's path would be consumed. After such a fire, herbaceous plants (fire followers), which are known to sprout after fires, would dominate the landscape for a few years. Over time (3-5 years) the shrub lands would regain their dominance, and after 5-10 years a mature assemblage of plants and wildlife would again be found on site (Dallman 1998).

The fire frequency in CSS is as frequent as chaparral due to the volatile oils and resins that occur in CSS plants. The plants, such as white sagebrush (*Saliva apiana*), are able to resprout after a fire or produce many seedlings from the dormant seed bank that lies in the soil. Seed germination of some species may also be stimulated by fire (Holland and Keil 1995, Dallman

1998). However, if the fire frequency and intensity are too great, plants in the CSS community, such as black sage (*Salvia mellifera*) and California sagebrush (*Artemisia californica*) are permanently killed and can no longer regenerate, slowly converting the CSS community to a nonnative, annual grassland (Southwest Division, Naval Facilities Engineering Command 1998).

Each CNLM HCA in San Diego has a different fire history and a different predicted fire future. For example, most of the Rancho La Costa (RLC) Habitat Conservation Area (HCA) burned in the Harmony Grove fire in October of 1996, while the Manchester HCA has not burned (except two very small fires) in its entirety since 1917. Prior to 1917 no data are recorded, so it is uncertain as to when the last significant fire event occurred in the Manchester HCA.

Regardless of fire history and the current vegetation characteristics, there are many realized or potential threats to the integrity of the CSS vegetation community (See RLC Habitat Management Plan CSS Ecological Model and Threats Section) that need to be evaluated:

1. What is the effect of the altered fire regime at each HCA?
2. What is the potential effect of global climate change?
3. What are the effects of urban edge?
4. What are the effects of fragmentation and isolation?
5. What are the effects of altered wildlife usage patterns?

These threats questions lead to other questions associated with their effect on ecological processes and patterns:

1. Are the variables investigated representing a threat?
2. At what spatial scale are the variables representing a threat?
3. How do the effects of the threats listed above effect the distribution and abundance of sensitive plant and wildlife species?
4. How do the threats listed above effect the distribution of non-sensitive plants and animals?
5. How do the effects of each threat alter ecological processes?
6. How do the various measured factors interact?

Predictions

Fire. We predict that as a result of fragmentation, complete burns of preserves are now less likely and there will be fewer, smaller fires resulting in a mosaic of CSS with various age structures.

Global Climate Change. We predict that rainfall patterns will change (likely decrease) over the next 100 years resulting in a lengthening of the fire season, frequency of lightening fires, frequency of drought, and areas burned. We predict:

1. Possible regime shifts (altered abundance and recruitment patterns in various native vegetation assemblages)

2. Altered invasion severity of exotic species due to changes from native-adapted variations in weather phenomena
3. Lowered seedling survival of species due to changes from native-adapted variations in weather phenomena
4. Lowered seed and/or clonal production of future generations due to changes from native-adapted variations in weather phenomena
5. Negative interactions between native wildlife and changes resulting from the above mentioned predictions in vegetative cover

Habitat Fragmentation and Urban Edge. We predict that habitat fragmentation will reduce plant diversity and migration and/or genetic exchange between plant populations. This could affect the CSS community by reducing vigor within populations and eventually leading to extinctions of specific plant species.. Habitat fragmentation has resulted in an increase of urban edge on all our preserves. We predict that this will result in increased pressures from nonnative plant species, illegal vegetation clearing, dumping, erosion, and other threats that will change the vegetation structure and composition.

Monitoring Methodology

Approximately fifty plots will be established inside three of our preserves, and the number per preserve allocated by the amount of acreage currently occupied by CSS in each preserve. These plots will be placed in a stratified random manner across our preserves. Stratification will take into account:

1. Size of preserve (or size of parcel?)
2. Slope and aspect
3. Distance from preserve edge/urban edge
4. Presence or absence of CAGN or San Diego horned lizard (*Phrynosoma coronatum blainvillii*)
5. Fire history

Plot Design and Setup

The plot design will be of a modified Whittaker nested vegetation sampling design as in Stohlgren et al. 1995. The dimensions of the macroplot will be 50 meters long by 20 meters wide. Three smaller nested plots will be placed inside the macroplot. The larger of these three is to be 20 meters long and 5 meters wide, placed in the center of the macroplot, with the long axis corresponding to that of the macroplot. The two other nested plots will be at opposite corners of the macroplot, and will be 5 by 2 meters in length, again with the long axis corresponding to that of the macroplot. The design of the modified Whittaker plot we are using deviates from that described in Stohlgren et al. 1995 by not including the 12 smaller 1- square meter rectangles. The long axis of the modified Whittaker plots will be set to cross the environmental gradient present. Sampling will be carried out for both continuous variables (percent cover by species, perennial species height), non-parametric and semi-continuous variables (count of shrub seedlings, species presence).

Point Intercept Data

Percent cover by species will be gathered by running a point-intercept transect along one or both long borders of the macroplots. In addition to species cover, height measurements will be collected for all perennial species measured as a "hit" along the transects. The point-intercept transects will be measured at half meter intervals, thus generating 98 "hits" along one or each long side of the macroplot. Living plants will count as a point or "hit," if a 1.5 millimeter dowel is intersected in the vertical plane by the living tissue of a plant. At each half meter, data pertaining to bare ground, rock, or litter incident with the dowel will also be collected.

Species Diversity, Recruitment and Mortality

Information gathered inside the plots will include species present in each plot, including the macroplotwhole plot. In the two small plots, and in the large central plot, counts of shrub seedlings by species will be documented.

Rational for a Two-Tiered Approach

The data collected in the macroplot, and smaller sub-plots will be useful in generating species area curves and (more importantly) in documenting species presence or absence, as well as recruitment and mortality over time. The advantages of using a multi-scaled approach to quantifying species richness are identified in Stohlgren et al. 1995. As the years progress, small changes in species presence or seedling recruitment may be observed as disappearances, appearances, increases, or decreases on the micro-scale of sub-plot. The appearance of nonnative species may be quickly identified on the macroplotscale, while the disappearance, or lack of recruitment among native shrubs may be apparent on the smaller plot scale prior to any notice of change on the macroplotscale. Another advantage of using smaller nested plots is that it provides an affordable estimate of shrub recruitment and mortality, since attempting to quantify these measures would be very labor-intensive if carried out on the macroplotscale.

The point-intercept transect measures will provide a method of quantifying change in abundance by species that may provide clues that tie into changes in recruitment or mortality among the sub-plot counts and diversity estimates. For instance, nonnative grasses and/or litter cover changes may be predictive as explanatory variables in a multi-factorial analysis of the response variables mortality or species number decline. Other variables that may be tied into a model explaining the measured pattern may include regional rainfall totals for the season and/or seasonal temperature averages, slope and aspect of plots, fire history, and the presence or absence of animal herbivory.

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Appendix 5

Village R Restoration Area

Appendix 5. Village R Restoration Area

Calavera and Robertson Ranch Habitat Conservation Area

100 50 0 100 Feet

Center for Natural Lands Management